

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

<b>Appellant:</b>	Charles E. Price	)	
<b>Serial No.:</b>	10/627,166	)	
<b>Filed:</b>	July 25, 2003	)	<b>Confirmation No.</b> 2507
		)	
<b>Group Art</b>		)	
<b>Unit:</b>	1793	)	
<b>Examiner:</b>	Paul D. Marcantoni	)	
		)	
<b>Attorney</b>		)	
<b>Docket:</b>	946478-263692	)	
		)	
<b>Title:</b>	CEMENTITIOUS	)	
	COMPOSITIONS AND	)	
	METHODS OF MAKING	)	
	AND USING	)	

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**APPELLANTS' BRIEF**

This Appeal Brief follows the format provided for in revised 37 CFR 41.37.

**STATEMENT OF THE REAL PARTY IN INTEREST**

Charah Environmental, Inc. is the real party in interest.

**STATEMENT OF RELATED CASES**

There are no prior or pending appeals, interferences, or judicial proceedings known to the Appellants, Appellants' legal representatives, or any other person who was substantively involved in the preparation or prosecution of the application, which are related to, directly affect, or would be directly affected by, or have a bearing on the Board's decision in this pending appeal.

**JURISDICTIONAL STATEMENT**

The appeal is taken under 35 U.S.C. § 134(a). The Office Action setting out the rejection on appeal is dated July 24, 2008. The Notice of Appeal was filed on November 24, 2008. This Appeal Brief is being filed on June 24, 2009, along with a five (5) month extension of time.

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**STATUS OF AMENDMENTS**

There were no claim amendments filed after the Office Action dated July 24, 2008. Appellants chose to proceed directly with this appeal. All previous papers filed by Appellants have been entered.

**GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 are rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,772,751 to Nisnevich et al. (“Nisnevich”). The Office Action dated July 24, 2008, indicates that Claim 6 is pending; however, Claim 6 was cancelled in the Amendment dated January 12, 2007.

Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 are rejected under 35 U.S.C. §103(a) as being obvious over Nisnevich.

Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 are rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,328,507 to Crocker (“Crocker”).

Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 are rejected under 35 U.S.C. §103(a) as being obvious over Crocker.



Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 are rejected under 35 U.S.C. §103(a) as being obvious over Nisnevich in view of Crocker.

### **STATEMENT OF FACTS**

1. In the Office Action dated July 24, 2008, the Examiner rejected Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under 35 U.S.C. §102(b) as being anticipated by Nisnevich. In rejecting Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under 35 U.S.C. §102(b) as being anticipated by Nisnevich, the Examiner asserts that “Applicants are referred to earlier statements regarding why Nisnevich is pertinent to Applicants’ instant claims.” (See Office Action dated July 24, 2008, Page 2, last paragraph). Each of the Office Actions dated August 5, 2004, April 27, 2005, November 29, 2005, July 12, 2006, February 8, 2007, September 26, 2007, and July 24, 2008, rejected Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under 35 U.S.C. §102(b) as being anticipated by Nisnevich. For the sake of brevity, the Office Actions dated August 5, 2004, April 27, 2005, November 29, 2005, July 12, 2006, February 8, 2007, September 26, 2007, and July 24, 2008, are collectively referred to herein as the “Office Actions”.

2. The Examiner made the following points in the Office Actions pertaining to the Examiner's assertion that Nisnevich anticipates Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41:

(i) Nisnevich teaches "a composition comprising bottom ash and cement thus anticipating the instant invention" (*see* Office Action dated August 5, 2004, Page 2, fourth paragraph);

(ii) "Applicants do not provide the specific amounts to obtain their compressive strengths nor is any amount provided in the specification to obtain their claimed compressive strengths. Absent amounts, the effective amounts as stated in the independent claims do not contain a specific range of amounts and without a critical range of amounts of bottom ash, cement (what kind!) and water, the Applicants' claimed compressive strength cannot be achieved" (*see* Office Action dated April 27, 2005, Page 6, second paragraph);

(iii) "The Applicants also argue that none of the references teach using a package (paper or plastic, etc.) and obtaining a lightweight product as they claim. Yet, it is the examiner's position that one of ordinary skill in the art would have understood to control the requisite amounts of the lightweight material (bottom ash) to cement ratio to control weight in commercial packaging and still

obtain minimum strength properties for sales.” (*See* Office Action dated April 27, 2005, Page 7, second paragraph);

(iv) Nisnevich teaches “a composition comprising cement and bottom ash (see Claims 1 and 5 in Col. 18) thus anticipating the instantly claimed invention.” (*see* Office Action dated November 29, 2005, Page 10, third paragraph);

(v) “The Applicants have argued their newly added limitation to their independent claims such as claim 1 of adding specific ranges of particle sizes of coarse and fine portions of fly ash [sic] now teach over the prior art. The examiner disagrees. There is indefiniteness and lack of clarity with respect to Applicant’s defined ranges of coarse and fine because they overlap and can potentially be the same. Thus, it is not seen how Applicants can define over the prior art when their own coarse and fine portions are not clearly defined and indistinguishable.” (*see* Office Action dated July 12, 2006, Page 10, second paragraph); and

(vi) “The Applicants also argue that the prior art does not teach mixing the first and second portions together. In rebuttal, the prior art teaches an overlap of both Applicants [sic] first and second portion bottom ash particle size [sic] so their [sic] would be an [sic] mixing together of these portions or particle

sizes. Again Applicants fail to distinguish one portion from the other because the portions' particle sizes overlap. Also, Applicants have yet to show criticality or unexpected results for their specific particle sizes/portions. The prior art still teaches amounts of bottom ash and cement that do overlap." (*see* Office Action dated September 26, 2007, Page 4, last paragraph).

3. In the Office Action dated July 24, 2008, the Examiner rejected Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under 35 U.S.C. §103(a) as being obvious over Nisnevich, and stated that "Applicants are referred to earlier statements regarding why Nisnevich is pertinent to Applicants' instant claims." (*See* Office Action dated July 24, 2008, Page 2, last paragraph). Each of the Office Actions rejected Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under 35 U.S.C. §103 (a) as being obvious over Nisnevich.

4. The Examiner made the following points in the Office Actions pertaining to the Examiner's assertion that Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 are obvious in view of Nisnevich:

(i) "Even if not anticipated [by Nisnevich], overlapping ranges or amounts would have been *prima facie* obvious to one of ordinary skill in the art. Also, since the prior art teaches the same components as the instantly claimed invention, it would have been expected that properties would also be expected to

be the same such as strength” (*see* Office Action dated August 5, 2004, Page 3, second paragraph);

(ii) “Further, control of particle size would have been an obvious design choice for one of ordinary skill in the art absent a showing of criticality or unexpected results” (*see* Office Action dated August 5, 2004, Page 2, fourth paragraph);

(iii) “Even if not anticipated, overlapping ranges of amounts would have been *prima facie* obvious to one of ordinary skill in the art” (*see* Office Action dated November 29, 2005, Page 10, third paragraph);

(iv) “The examiner maintains that the prior art does teach Applicants’ particle size ranges and thus overlaps it. Even assuming it did not, control of particle sizes would have been an obvious design choice for one of ordinary skill in the art absent a showing of criticality or unexpected results (e.g. such as compressive strengths” (*see* Office Action dated February 8, 2007, Page 9, second paragraph);

(v) “it is the examiner’s position that control of particle size would have been an obvious choice absent a showing of criticality or unexpected results. The examiner finds that this [sic] would be difficult to show criticality or unexpected results especially considering that claims directed to the property

needed to show unexpected results (ie compressive strength) have all been canceled by Applicants. Absent this showing, the prima facie case of obviousness has not been overcome.” (*see* Office Action dated September 26, 2007, Page 3, last paragraph); and

(vi) “The examiner maintains that Applicants cannot argue this feature [high compressive strength] because they have not shown that their ‘claimed’ invention have [sic] all the features that allow for them to obtain high compressive strengths such as specific particle size, water/cement ration, specific amounts of Portland cement vs bottom ash, etc. It is improper to argue features not present in their own claims and Applicants cannot rely on their disclosure for the deficiency of limitations in their claims.” (*See* Office Action dated September 26, 2007, Page 4, first full paragraph).

5. Nisnevich discloses “a light-weight concrete comprising cement, highly porous coarse and/or fine aggregates, such as furnace bottom-ash from thermal power stations or other porous natural or artificial materials, with a porosity of about 20-50% and an additive, preferably fly ash from thermal power stations or other, natural or artificial, finely ground materials passing a screen of about 100  $\mu\text{m}$ , and water.” (*See* Nisnevich, Col. 17, Lines. 48-55).

6. Nisnevich teaches as follows:

Aggregates may be subdivided according to their grading (i.e., particle size) to (i) coarse aggregates, defined as particles having a diameter higher than 4.75 mm (according to ASTM C330-89 and C331-89) or 5.00 mm (according to BS 3797:1990); (ii) fine aggregates with particle size smaller than 4.75 mm (according to ASTM C330-89 and C331-89) or 5.00 mm (according to BS 3797:1990); and (iii) compound (also known as combined) aggregates which include a combination of coarse and fine aggregates (according to ASTM C330-89 and C331-89).

(See Nisnevich, Col. 1, Lines. 33-42).

7. Nisnevich further discloses that:

Three main types of light-weight aggregates are specified in the specification of ASTM C330-89 and ASTM C 331-89 as follows:

- (a) Aggregates prepared by processing natural materials such as pumice, scoria and tuff (which are volcanic igneous rocks containing air voids and having an open texture).
- (b) Aggregates prepared by expanding pelletizing or sintering products such as blast-furnace slag, clay, diatomite, fly-ash, shale, slate and the like.
- (c) Aggregates which are the end products of coal or coke combustion (such as furnace bottom ash and fused residues from furnaces fired with coal which has not been pulverized).

(See Nisnevich, Col. 2, Lines. 33-46).

8. Nisnevich discloses three major drawbacks from using light-weight aggregates of high porosity in concrete production, namely, (a) reduced strength of the produced concrete due to replacement of the normal-weight aggregates (*see*

Nisnevich, Col. 2, Lines. 50-57); (b) undesired segregations of the components of the concrete mix during the process of mixing, handling and placing the concrete (*see* Nisnevich, Col. 2, Lines. 58-65); and (c) the formation of air-voids in the hardened cement paste when low to middle-range quantities of cement occurring in insulating and some structural light-weight concretes that allow penetration of water and aggressive environmental conditions, not only to the hardened cement paste, but also to the light-weight (porous) coarse and fine aggregates, which increases the area of environmental attack on the concrete, resulting in rapid degradation (*see* Nisnevich, Col. 2, Lines. 66-67, and Col. 3, Lines. 1-9).

9. Regarding the use of furnace bottom-ash wastes as an aggregate, Nisnevich further discloses that:

The furnace bottom-ash wastes from thermal power stations are permissible as aggregates for light-weight concrete by the ASTM C331-89; and the BS 3797:1990, SI5, part 1, 1989, standards. However, these standards are limited to general recommendations as to the possible uses of different wastes and are elaborated in this respect on an essentially lower level than the requirements for other aggregates, such that it is practically substantially impossible to use highly porous furnace bottom-ash to provide a light-weight concrete with the required strength and durability for most applications.

For example, using furnace bottom-ash from thermal power stations with a density of 1.0 to 1.2 g/cm.<sup>sup.3</sup>, obtained was, depending on the cement content, a light-weight concrete characterized by low strengths as measured by compressing a standard sample, having



dimensions of 100x100x100 mm<sup>3</sup>, on a press, as summarized in Table II, wherein MPa is megapascal.

TABLE II

Content of cement concrete	Strength of light-weight
	MPa
Kg/m <sup>3</sup>	
150	1.8
200	4
250	6
300	8.5

In view of the low strength of light-weight concretes based upon the use of highly porous furnace bottom-ash from thermal power stations as aggregates (as for example depicted in Table II above), their use is limited even in articles such as masonry units. The excessive porosity of the furnace bottom-ash aggregates has a negative influence on the strength and durability of these concretes, which negative influence adds to the negative influence imposed by the porosity of the hardened cement paste itself in concrete structures characterized by low to medium cement content (see Table III, hereinbelow).

(See Nisnevich, Col. 6, Lines. 27-53). In this regard, Nisnevich discloses that the use of only cement and bottom ash resulted in a twenty-eight day compressive strength of 4.9 MPa (710 psi). (See Nisnevich, Col. 15, Lines. 10-27).

10. In order to overcome the problems associated with using bottom ash as an aggregate, Nisnevich teaches replacing part of the cement with fly-ash (or

another “additive”, which Nisnevich defines as a fine material which passes a screen of about 100  $\mu\text{m}$  and has a medium density value, such as limestone, dolomite, sandstone and the like, preferably from waste formed during crushed stone production) to thereby replace air-voids in the cement hardened paste thus formed and, at least partially, fill-in open pores of the porous light-weight aggregates, resulting in a denser and stronger concrete. (See Nisnevich, Col. 7, Lines. 26-50).

11. More specifically, Nisnevich discloses that the light-weight concrete mix comprises “about 8-20% cement by weight, preferably the cement having a high density e.g., in the range of about 2.9-3.3  $\text{g}/\text{cm}^3$ , about 13-33% of an additive, by weight, the additive having a medium density, preferably in the range of about 1.5-2.5  $\text{g}/\text{cm}^3$ , and about 29-67% of a light-weight porous aggregate, by weight, the aggregate having a low density in the range of about 1.0-1.8  $\text{g}/\text{cm}^3$  and water, the additive being for reducing segregation of the light-weight porous aggregates while preparing the concrete mix, while at the same time for reducing the cement content in the light-weight concrete mix.” (See Nisnevich, Col. 3, Lines. 61-67, and Col. 4, Lines. 1-6).

12. According to Nisnevich, “the additive is selected from the group consisting of fly-ash and grounded limestone, dolomite, and sandstone having a

grain size smaller than about 100 micrometers” and “the aggregates are selected from the group of aggregates consisting of a fine light-weight aggregates having a bulk density lower than  $1,200 \text{ kg/m}^3$  and passing a sieve of 4.75 mm, a coarse light-weight aggregate having a bulk density lower than  $1,000 \text{ kg/m}^3$  and retained in a sieve of 4.75 mm and a compound light-weight aggregate having a bulk density lower than  $1,040 \text{ kg/m}^3$ .” (See Nisnevich, Col. 4, Lines. 22-26 and Lines. 32-39).

13. Nisnevich discloses that the “density (including the pores) of the furnace bottom-ash from thermal power stations, based on data from numerous tests, is from  $1.0$  to  $1.8 \text{ g/cm}^3$ , whereas the density of the fly-ash is from  $2.0$  to  $2.2 \text{ g/cm}^3$ .” (See Nisnevich, Col. 6, Lines. 23-26).

14. In the Office Action dated July 24, 2008, the Examiner rejected Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under 35 U.S.C. §102(b) as being anticipated by Crocker. In support of this rejection, the Examiner asserted that Crocker “teaches packaging or bagging a mixture of aggregate (similar aggregate includes ash materials such as fly ash or bottom ash because they are conventional in the art as is sand for cement/concrete) wherein the container and composition together weigh nor [sic] more than about 100 ppcf.” (See Office Action dated July 24, 2008, Page 3, first paragraph).

15. In the Office Action dated July 24, 2008, the Examiner rejected Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under 35 U.S.C. §103(a) as being obvious over Crocker. In support of this rejection, the Examiner asserted that Crocker “teaches packaging or bagging a mixture of aggregate (similar aggregate includes ash materials such as fly ash or bottom ash because they are conventional in the art as is sand for cement/concrete) wherein the container and composition together weigh nor [sic] more than about 100 ppcf.” (*See* Office Action dated July 24, 2008, Page 3, last paragraph).

16. In the Office Action dated July 24, 2008, the Examiner rejected Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under 35 U.S.C. §103(a) as being obvious over Crocker or, in the alternative, obvious over Nisnevich in view of Crocker. In support of this rejection, the Examiner asserted that Crocker “teaches the same package or container as claimed by applicants for their instant invention and thus the use of this particular package, for example, in the Nisnevich cement/aggregate composition, would have been an obvious design choice for one of ordinary skill in the art.” (*See* Office Action dated July 24, 2008, Page 3, last paragraph).

17. Crocker discloses a cementitious composition including a dry mixture of hydraulic cement component and an aggregate component. (*See* Crocker, Col. 2, Lines. 57-67).

18. Crocker does not disclose the use of bottom ash as the aggregate component or the sizing of the aggregate component or portions of the aggregate component.

19. Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 of the Application recite that the bottom ash comprises a first portion and a second portion in which the first portion comprises a particle size of less than about .006 inches and the second portion comprises a particle size between .75 inches to .003 inches and that the first and second portions are mixed together to provide a particle distribution for the bottom ash wherein approximately fifty percent of the bottom ash has a particle size less than about .012 inches.

20. The Application teaches that in preparing the “primarily” coarse portion, “not all particles having a particle size below about 5.9 mil (150  $\mu$ m) are removed by screening.” (*See* Application, Page 4, Paragraph 47).

21. The Application discloses that “[s]tructural products formed from mixing the composition of the present invention with an effective amount of

water....preferably have a twenty-eight-day compressive strength of at least about 4,000 psi.” (See Application, Page 5, Paragraph 53).

## **ARGUMENT**

### **I. Rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 as Anticipated by Nisnevich**

#### **A. The Office Action Dated July 24, 2008, Fails to Comply with 37 CFR 1.104**

Inasmuch as independent Claims 1, 26, 34 and 41 were amended in each of the Amendments dated August 8, 2007, January 12, 2007, September 23, 2005, May 30, 2006, February 7, 2005, Appellants formerly object to the Examiner’s general incorporation by reference of points made in Office Actions issued prior to the Office Action dated July 24, 2008, as the claims considered and rejected in the prior Office Actions are different in scope from the claims rejected in the Office Action dated July 24, 2008, which are the subject of this appeal. Appellants respectfully submit that the Examiner’s failure to clearly articulate the basis of the rejections constitutes a failure to comply with (a) the requirements of 37 CFR 1.104(b) that the Office Action dated July 24, 2008, be complete as to all matters and (b) the requirements of 37 CFR 1.104(c)(2) that the Office Action dated July

24, 2008, designate the particular part of Nisnevich relied on by the Examiner as nearly as practicable and clearly explain the pertinence of Nisnevich and each rejected claim. This argument has not been previously presented to the Examiner. It should be noted for the record that the Examiner's failure to so comply with these requirements has unduly complicated the preparation and consideration of this appeal.

B. Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 Are Not Anticipated by Nisnevich

1. Legal Requirements For The Rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 Under 35 U.S.C. §102(b) Based on Nisnevich

To anticipate a claim under 35 U.S.C. §102(b), a reference must teach every element of the rejected claim. *See Verdegaal Bros. v. Union Oil Co. of California* 814 F.2d 628, 631, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987) (holding that “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference”); and *see also* M.P.E.P. § 2131.

When the claims under consideration recite a range, it must be determined (a) whether the prior art (a) discloses a specific example falling within the claimed range or (b) discloses a range which touches or overlaps the claimed range, but no

specific examples falling within the claimed range are disclosed. In the case where the prior art discloses a specific example falling within the claimed range, then the recited range is taught by the prior art. *See Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985); and *see also* M.P.E.P. § 2131.03(I).

However, when the prior art discloses a range which touches or overlaps the claimed range, but no specific examples falling within the claimed range are disclosed, then a determination must be made as to whether the claimed subject matter is disclosed in the reference with “sufficient specificity” to constitute an anticipation under the statute. *See Atofina v. Great Lakes Chem. Corp*, 441 F.3d 991, 999, 78 USPQ2d 1417, 1423 (Fed. Cir. 2006). As explained in M.P.E.P. § 2131.03(II):

When the prior art discloses a range which touches or overlaps the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with “sufficient specificity to constitute an anticipation under the statute.” What constitutes a “sufficient specificity” is fact dependent. If the claims are directed to a narrow range, and the reference teaches a broad range, depending on the other facts of the case, it may be reasonable to conclude that the narrow range is not disclosed with “sufficient specificity” to constitute an anticipation of the claims. *See, e.g., Atofina v. Great Lakes Chem. Corp*, 441 F.3d 991, 999, 78 USPQ2d 1417, 1423 (Fed. Cir. 2006) wherein the court held that a reference temperature range of 100-500 degrees C did not describe the claimed range of 330-450 degrees C with sufficient specificity to be anticipatory. Further, while there was



a slight overlap between the reference's preferred range (150-350 degrees C) and the claimed range, that overlap was not sufficient for anticipation. "[T]he disclosure of a range is no more a disclosure of the end points of the range than it is each of the intermediate points." *Id.* at 1000, 78 USPQ2d at 1424. Any evidence of unexpected results within the narrow range may also render the claims unobvious. The question of "sufficient specificity" is similar to that of "clearly envisaging" a species from a generic teaching. See MPEP § 2131.02. A 35 U.S.C. 102/ 103 combination rejection is permitted if it is unclear if the reference teaches the range with "sufficient specificity." The examiner must, in this case, provide reasons for anticipation as well as a \*reasoned< statement regarding obviousness. *Ex parte Lee*, 31 USPQ2d 1105 (Bd. Pat. App. & Inter. 1993) (expanded Board).

2. The Examiner Erred in Rejecting Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 Under 35 U.S.C. §102(b) Based on Nisnevich

a. The Office Action Dated July 24, 2008, Does Not Present a *Prima Facie* Case of Anticipation

The legal basis relied upon by the Examiner to reject Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under 35 U.S.C. §102(b) based on Nisnevich is best summarized by the point made by the Examiner in the Office Action dated September 26, 2007, namely, that:

In rebuttal, the prior art teaches an overlap of both Applicants [sic] first and second portion bottom ash particle size [sic] so their [sic] would be an [sic] mixing together of these portions or particle sizes. Again Applicants fail to distinguish one portion from the other because the portions' particle sizes overlap. Also, Applicants have yet to show criticality or unexpected results for their specific particle sizes/portions. The prior art still teaches amounts of bottom ash and cement that do overlap.

(*See* Office Action dated September 26, 2007, Page 4, last paragraph). Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 recite that the bottom ash comprises a first portion and a second portion in which the first portion comprises a particle size of less than about .006 inches and the second portion comprises a particle size between .75 inches to .003 inches and that the first and second portions are mixed together to provide a particle distribution for the bottom ash wherein approximately fifty percent of the bottom ash has a particle size less than about .012 inches. As previously pointed out to the Examiner (*see* Pre-Appeal Brief Request for Review dated March 26, 2008, Page 4, Section 2, first full paragraph; the Amendment dated August 8, 2007, Page 9, third full paragraph; and the Amendment dated January 12, 2007, paragraph bridging Pages 14 and 15), the Examiner has not cited in any of the Office Actions a specific range of particle sizes taught by Nisnevich relative to the particle distribution ranges of the first and second portions of the bottom ash and/or the resulting particle distribution of the bottom ash has as a whole.

In addition, Appellants submit as a new argument that the Examiner has further failed to provide any explanation or reasons as to how any ranges purportedly taught by Nisnevich are disclosed with “sufficient specificity” to

constitute an anticipation under the statute. *See Atofina*, 441 F.3d at 999, 78 USPQ2d at 1423. While implicit in Appellants' prior arguments to the Examiner, Appellants state for the first time explicitly that the legal basis set forth in the Office Action dated July 24, 2008, even taken together with the points made by the Examiner in the prior Office Actions, does not constitute even a *prima facie* case of anticipation due to the failure to provide any explanation or reasons as to how any ranges purportedly taught by Nisnevich are disclosed with "sufficient specificity" to constitute an anticipation under the statute." *See Atofina*, 441 F.3d at 999, 78 USPQ2d at 1423.

b. Nisnevich Does Not Disclose Every Element of  
Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41

Nisnevich discloses an example of a cementitious composition comprising forty percent (40%) cement and sixty percent (60%) bottom ash that resulted in a twenty-eight day compressive strength of 4.9 MPa (710 psi). (*See Nisnevich*, Col. 15, Lines. 10-27). Nisnevich also discloses a light-weight concrete mix that comprises "about 8-20% cement by weight, preferably the cement having a high density e.g., in the range of about 2.9-3.3 g/cm<sup>3</sup>, about 13-33% of an additive, by weight, the additive having a medium density, preferably in the range of about 1.5-2.5 g/cm<sup>3</sup>, and about 29-67% of a light-weight porous aggregate, by weight, the

aggregate having a low density in the range of about 1.0-1.8 g/cm<sup>3</sup> and water....” (See Nisnevich, Col. 3, Lines. 61-67, and Col. 4, Lines. 1-2). Nisnevich also discloses that “[a]ggregates may be subdivided according to their grading (i.e., particle size) to (i) coarse aggregates, defined as particles having a diameter higher than 4.75 mm (according to ASTM C330-89 and C331-89) or 5.00 mm (according to BS 3797:1990); (ii) fine aggregates with particle size smaller than 4.75 mm (according to ASTM C330-89 and C331-89) or 5.00 mm (according to BS 3797:1990); and (iii) compound (also known as combined) aggregates which include a combination of coarse and fine aggregates (according to ASTM C330-89 and C331-89).” (See Nisnevich, Col. 1, Lines. 33-42).

However, as previously pointed out to the Examiner (*see* Pre-Appeal Brief Request for Review dated March 26, 2008, Page 4, Section 2, first full paragraph, the Amendment dated August 8, 2007, Page 9, second full paragraph, and the Amendment dated January 12, 2007, Page 14, first full paragraph), Nisnevich does not disclose a cementitious composition comprising bottom ash as recited in Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41, wherein the bottom ash comprises:

- (a) a first portion and a second portion in which the first portion comprises a particle size of less than about .006 inches and the

second portion comprises a particle size between .75 inches to .003 inches; and

- (b) mixing the first and second portions together to provide a particle distribution for the bottom ash wherein approximately fifty percent of the bottom ash has a particle size less than about .012 inches.

Regarding the Examiner's assertion that the "the prior art teaches an overlap of both Applicants [sic] first and second portion bottom ash particle size [sic] so their [sic] would be an [sic] mixing together of these portions or particle sizes" (*see* Office Action dated September 26, 2007, Page 4, last paragraph), Appellants disagree. First, Appellants previously pointed out to the Examiner (*see* Pre-Appeal Brief Request for Review dated March 26, 2008, Page 4, Section 2, first full paragraph) that Nisnevich does not teach the particle distributions for the first portion and second portion of the bottom ash, or particle distribution of the bottom ash resulting from mixing the first and second portions with "sufficient specificity" to anticipate Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41. *See Atofina*, 441 F.3d at 999, 78 USPQ2d at 1423.

The argument set forth in this paragraph is a new argument. As explained by the Court of Appeals for the Federal Circuit in *Atofina*, "[i]f the claims are

directed to a narrow range, and the reference teaches a broad range, depending on the other facts of the case, it may be reasonable to conclude that the narrow range is not disclosed with “sufficient specificity” to constitute an anticipation of the claims.” *Atofina*, 441 F.3d at 999, 78 USPQ2d at 1423. In the present case, Nisnevich at most teaches using a coarse aggregate of bottom ash having a diameter higher than 4.75 mm (.187 inches) and using fly ash or another “additive”, which Nisnevich defines as a fine material which passes a screen of about 100  $\mu$ m (.004 inches) and has a medium density value, such as limestone, dolomite, sandstone and the like, preferably from waste formed during crushed stone production). (See Nisnevich, Col. 7, Lines. 26-50). Considering that Nisnevich teaches such a broad range for the particle distribution of the bottom-ash and teaches that “[t]he excessive porosity of the furnace bottom-ash aggregates has a negative influence on the strength and durability of these concretes, which negative influence adds to the negative influence imposed by the porosity of the hardened cement paste itself in concrete structures characterized by low to medium cement content” (see Nisnevich, Col. 6, Lines. 27-53), Appellants submit that it is reasonable to conclude that the narrow range is not disclosed with “sufficient specificity” to constitute an anticipation of the claims.

However, even if Nisnevich does anticipate the particle distribution ranges recited in Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41, which Appellants submit it does not, Nisnevich does not disclose sizing the bottom ash into first and second portions or mixing the first and second portions of the bottom ash together. The Examiner's assertion that the "prior art still teaches amounts of bottom ash and cement that do overlap" (*see* Office Action dated September 26, 2007, Page 4, last paragraph) simply and improperly disregards these elements recited in Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41, namely, the sizing of the bottom ash into first and second portions and then mixing the first and second portions together. As held by the Court of Appeals for the Federal Circuit, "[a] claim is anticipated **only if** each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal*, 814 F.2d at 631, 2 USPQ2d at 1053. (Emphasis provided). The argument that Nisnevich does not teach every element recited in Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 has been previously pointed out to the Examiner generally (*see* Pre-Appeal Brief Request for Review dated March 26, 2008, Page 4, Section 2, first full paragraph, the Amendment dated August 8, 2007, Page 9, second full paragraph, and the Amendment dated January 12, 2007, Page 14, first full paragraph). This is the first

time Appellants have presented this argument in the manner set forth in this paragraph.

The Examiner has previously asserted in the Office Actions that “[t]here is indefiniteness and lack of clarity with respect to Applicant’s defined ranges of coarse and fine because they overlap and can potentially be the same. Thus, it is not seen how Applicants can define over the prior art when their own coarse and fine portions are not clearly defined and indistinguishable.” (*See* Office Action dated July 12, 2006, Page 10, second paragraph). In the Office Action dated September 26, 2007, the Examiner rejected Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under 35 U.S.C. § 112, second paragraph, asserting that “[t]he terms ‘first portion’ and ‘second portion’... are indefinite because there is overlap between both particle size portions and it is not possible to distinguish clearly between the two portions in all independent claims or wherever it occurs in Applicants’ claims.” (*See* Office Action dated September 26, 2007, Page 3, second and third paragraphs). Regarding the overlap between the particle sizes of the first and second portions, Appellants have previously pointed out to the Examiner (*see* the Pre-Appeal Brief Request for Review dated March 26, 2008, Page 4, fifth paragraph) that the specification clearly explains that in preparing the “primarily” coarse portion “not all particles having a particle size below about 5.9 mil (150



µm) are removed by screening.” (*See* Application, Page 4, Paragraph 47). The Office Action dated July 24, 2008, did not continue the rejection under 35 U.S.C. § 112, second paragraph. However, to the extent the Examiner maintains that the Appellants do not define over Nisnevich because “their own coarse and fine portions are not clearly defined and indistinguishable” (*see* Office Action dated September 26, 2007, Page 3, second and third paragraphs), Appellants traverse such point for the same reasons that were previously pointed out to the Examiner, namely, that the specification clearly explains that in preparing the “primarily” coarse portion “not all particles having a particle size below about 5.9 mil (150 µm) are removed by screening.” (*See* Application, Page 11, ll. 20-21).

Since Nisnevich does not teach each and every element of the claimed invention, Appellants submit that the rejection under 35 U.S.C. §102(b) based on Nisnevich is improper and should be reversed.

**II. Rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 as Obvious Over Nisnevich**

A. The Office Action Dated July 24, 2008, Fails to Comply with 37 CFR 1.104

Appellants incorporate herein the objection set forth above in Section I(A)(1), that the Examiner's general incorporation by reference of points made in Office Actions issued prior to the Office Action dated July 24, 2008, constitutes a failure by the Examiner to comply with (a) the requirements of 37 CFR 1.104(b) that the Office Action dated July 24, 2008, be complete as to all matters and (b) the requirements of 37 CFR 1.104(c)(2) that the Office Action dated July 24, 2008, designate the particular part of Nisnevich relied on by the Examiner as nearly as practicable and clearly explain the pertinence of Nisnevich and each rejected claim.

B. Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 Are Not Obvious in View of Nisnevich

1. Legal Requirements For The Rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 Under 35 U.S.C. §103(a) Based on Nisnevich

An invention is unpatentable due to obviousness if "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." 35

U.S.C. §103(a). According to long-standing Supreme Court precedent, prior to a determination of obviousness being made, “the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved.” *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 466 (1966). Furthermore, in comparing the prior art to the claims at issue in accordance with *Graham*, the Examiner must consider all of the claim limitations in view of the prior art. *See In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970); and *see also* M.P.E.P. § 2143.03.

In a recent decision concerning obviousness, the Supreme Court held that “the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR v. Teleflex*, 550 U.S. 398, 416, 82 USPQ2d 1385, 1395 (2007). In that case, the Supreme Court further held that “when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious.” *KSR*, 550 U.S. at 416, 82 USPQ2d at 1395 (citing *United States v. Adams*, 383 U.S. 39, 50-51, 148 USPQ 479, 483). While nonobviousness may be established by a showing that the prior art teaches away from the claimed invention, “[o]bviousness can be established by combining or modifying the

teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so.” M.P.E.P. §2143.01; *see also In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006). Indeed, “the test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art.” M.P.E.P. §2143.01.

The Examiner has the initial burden of establishing a *prima facie* case of obviousness by providing a “clear articulation of the reason(s) why the claimed invention would have been obvious.” M.P.E.P. § 2142. In that regard, the Supreme Court recently held that the analysis supporting an obviousness rejection “should be made explicit.” *KSR*, 550 U.S. at 418, 82 USPQ2d at 1396 (affirming the Federal Circuit’s holding in *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) that “rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”). Furthermore, “the Examiner must provide evidence which as a whole shows that the legal determination sought to be proved (*i.e.*, the reference teachings establish a *prima facie* case of obviousness) is more probable than not.” *See* M.P.E.P. § 2142.

The Federal Circuit has repeatedly held that a “*prima facie* case of obviousness typically exists when the ranges of a claimed composition overlap the

ranges disclosed in the prior art.” *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ2d 1379, 1382 (Fed. Cir. 2003); *see also In re Harris*, 409 F.3d 1339, 1341, 74 USPQ2d 1951, 1953 (Fed. Cir. 2005); *In re Geisler*, 116 F.3d 1465, 1469, 43 USPQ2d 1362, 1364-65 (Fed. Cir. 1997). However, the foregoing rule should only be applied in “cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims.” *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). Furthermore, in cases where the “disclosed range is so broad as to encompass a very large number of possible distinct compositions,” a *prima facie* case of obviousness may not be established based on overlapping ranges. *In re Peterson*, 315 F.3d at 1392; 65 USPQ2d at 1382 (n. 1, citing *In re Baird*, 16 F.3d 380, 29 USPQ2d 1550 (Fed. Cir. 1994) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992)).

Once the Examiner has established a *prima facie* case of obviousness, the burden shifts to the applicant to demonstrate that the claimed subject matter is nonobvious. *See* M.P.E.P. § 2142. The Supreme Court has held that objective evidence of nonobviousness submitted by the applicant should be considered in making the determination as to whether the claimed invention is patentable over the prior art. *See Graham*, 383 U.S. at 17-18, 148 USPQ at 467. According to M.P.E.P. § 2141, “[s]uch evidence, sometimes referred to as ‘secondary

considerations,' may include evidence of commercial success, long-felt but unsolved needs, failure of others, and unexpected results." *See also Graham*, 383 U.S. at 17, 148 USPQ at 467. In particular, superiority of a property that the claimed invention shares with the prior art is evidence of nonobviousness that can rebut a *prima facie* case of obviousness. *See* M.P.E.P. § 716.02(a). In addition, the Federal Circuit has held that the evidence may be included in the specification as filed. *See In re Soni*, 54 F.3d 746, 750, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995); *see also* M.P.E.P. § 2141. Finally, the Federal Circuit has held that a *prima facie* case of obviousness based on overlapping ranges may be overcome by showing "that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range," *In re Woodruff*, 919 F.2d at 1578, 16 USPQ2d at 1936, or "that the prior art taught away from the claimed invention." *Iron Grip Barbell v. USA Sports*, 392 F.3d 1317, 1322, 73 USPQ2d 1225, 1228 (Fed. Cir. 2004) (citing *In re Geisler*, 116 F.3d at 1471, 43 USPQ2d at 1366).

2. The Examiner Erred in Rejecting Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 Under 35 U.S.C. § 103(a) Based on Nisnevich.
  - a. Under *Graham* and *KSR*, the Claimed Invention Would Not Have Been Obvious to One of Ordinary Skill in the Art Based on the Teachings of Nisnevich.

Upon evaluating the scope and content of Nisnevich and comparing the teachings of Nisnevich to the claims of the present application, it is clear that the subject matter set forth in the present claims would not have been obvious to one of ordinary skill in the art. Nisnevich does not teach, suggest, or motivate the fabrication of a high-strength lightweight concrete using cement and bottom ash that meets the elements of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41, namely, the sizing of two distinct portions of bottom ash having the particle size ranges set forth in the independent claims, the mixing of the two portions together to form a combined bottom ash wherein approximately fifty percent of the bottom ash has a particle size less than about .012 inches, and the combination of the mixed bottom ash with cement in a ratio between 2:1 and 2:3 by weight, to produce a high-strength lightweight concrete. In fact, Nisnevich teaches away from the subject matter of the present invention.

Nisnevich discloses “a light-weight concrete comprising cement, highly porous course and/or fine aggregates, such as furnace bottom-ash from thermal power stations or other porous natural or artificial materials, with a porosity of about 20-50% and an additive, preferably fly ash from thermal power stations or other, natural or artificial, finely ground materials passing a screen of about 100  $\mu\text{m}$ , and water.” (See Nisnevich, Col. 17, Lines. 48-55). According to Nisnevich, “the aggregates are selected from the group of aggregates consisting of a fine light-weight aggregates having a bulk density lower than  $1,200 \text{ kg/m}^3$  and passing a sieve of 4.75 mm, a coarse light-weight aggregate having a bulk density lower than  $1,000 \text{ kg/m}^3$  and retained in a sieve of 4.75 mm and a compound light-weight aggregate having a bulk density lower than  $1,040 \text{ kg/m}^3$ .” (See Nisnevich, Col. 4, Lines. 22-26 and Lines. 32-39). Nisnevich further discloses that furnace bottom-ash from thermal power stations may be used as the aggregate. (See Nisnevich, Col. 17, Lines. 48-55).

Nisnevich repeatedly asserts that the use of bottom-ash as an aggregate in the manufacture of concrete without the addition of a denser additive is not advisable as it negatively impacts the resulting compressive strength of the resulting concrete, among other problems. For example, Nisnevich discloses that “it is practically substantially impossible to use highly porous furnace bottom-ash



to provide a light-weight concrete with the required strength and durability for most applications” (See Nisnevich, Col. 6, Lines. 34-37, emphasis added). In addition, Nisnevich discloses that “[t]he excessive porosity of the furnace bottom-ash aggregates has a negative influence on the strength and durability of these concretes, which negative influence adds to the negative influence imposed by the porosity of the hardened cement paste itself in concrete structures characterized by low to medium cement content.” (See Nisnevich, Col. 6, Lines. 59-64, emphasis added). In order to overcome the shortfalls associated with using bottom ash as an aggregate, Nisnevich teaches replacing part of the cement with an additive. (See Nisnevich, Col. 17, Lines. 48-55). To illustrate the low strength values obtained without using an additive, Nisnevich provides an example of concrete manufactured using only cement and bottom ash that has a 28-day compressive strength of 4.9 MPa (710 psi). (See Nisnevich, Col. 15, Lines. 10-27).

Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 of the present application recite the sizing of two distinct portions of bottom ash such that the first portion comprises a particle size of less than about .006 inches and the second portion comprises a particle size between .75 inches to .003 inches, the mixing together of the portions such that approximately fifty percent of the resulting mixed bottom ash has a particle size less than about .012 inches, and the combination of the

mixed bottom ash with cement in a ratio between 2:1 and 2:3 by weight. Compliance with the process described in these particular claim limitations results in a cement having a 28-day compressive strength of at least 4,000 psi.

In comparing the teachings of Nisnevich to Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 of the present application, as previously pointed out to the Examiner (*see* Pre-Appeal Brief Request for Review dated March 26, 2008, Page 3, Section 3, first full paragraph, the Amendment dated August 8, 2007, Page 9, second full paragraph, and the Amendment dated January 12, 2007, Page 14, last paragraph), it is evident that Nisnevich does not teach, motivate, or suggest the particular claim elements of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41. In this regard, Nisnevich teaches that in choosing an aggregate, one may use any of the following: bottom ash greater than 4.75 mm in size, bottom ash less than 4.75 mm, or a combination of bottom ash greater than 4.75 mm in size and bottom ash less than 4.75 mm. (*See* Nisnevich, Col. 4, Lines. 22-26 and Lines. 32-39). Therefore, Nisnevich discloses that bottom ash of any size may be utilized, and Nisnevich does not teach or otherwise offer any guidance on particular particle size ranges that are preferable. Appellant submits that inasmuch as Nisnevich does not teach, motivate, or suggest sizing the bottom ash at all, and, indeed, teaches that any particle size can be used, it would not be obvious to one of ordinary skill in the art

to size two distinct portions of bottom ash having the particular particle size ranges of less than about .006 inches and between .75 inches to .003 inches, respectively, and mix together the portions such that approximately fifty percent of the resulting mixed bottom ash has a particle size less than about .012 inches.

Furthermore, not only does Nisnevich not teach, motivate, or suggest the particular claim elements of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41, but Nisnevich teaches away from the claimed invention, as evidenced by Nisnevich enumerating and emphasizing the negative attributes of concrete formed of cement and bottom ash alone, most notably the low compressive strengths associated with such concretes. (*See* Nisnevich, Col. 6, Lines. 34-64). Despite the contrary teachings of Nisnevich, Appellants were successful in manufacturing a concrete using bottom ash and cement that boasts a 28-day compressive strength that is over five and half times greater than the compressive strength set forth in the relevant example provided in Nisnevich (4,000 psi as compared to 710 psi). (*See* Nisnevich, Col. 15, Lines. 10-27 *and see* Application, Page 5, Paragraph 53). While the higher strength value has been previously pointed out to the examiner (*see* Pre-Appeal Brief Request for Review dated March 26, 2008, Page 5, first full paragraph), the foregoing argument regarding Nisnevich teaching away from the claimed invention has not been previously presented to the Examiner. Under *KSR*,

the foregoing evidence of successful (and unpredictable) results in the face of Nisnevich's contrary teachings support a finding that the claimed invention is nonobvious. *See KSR*, 550 U.S. at 416, 82 USPQ2d at 1395.

Therefore, because each of the claim elements of the present invention are not suggested, motivated, or taught by Nisnevich, and because the subject matter of such claim elements allowed the Appellants to achieve far-superior results that contradict the explicit teachings of Nisnevich, Appellants submit that the subject matter of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 would not have been obvious to one of ordinary skill in the art in light of Nisnevich.

- b. The Office Action Dated July 24, 2008, Does Not Present a *Prima Facie* Case of Obviousness Because the Examiner Failed to Provide Evidence or Reasoning to Support the Finding of Obviousness.

In rejecting the claims of the application as obvious over Nisnevich, the Examiner failed to explicitly set forth the analysis leading to the conclusion of obviousness as required by law. *See KSR*, 550 U.S. at 418, 82 USPQ2d at 1396. Indeed, as previously pointed out to the Examiner (*see* Pre-Appeal Brief Request for Review dated March 26, 2008, Pages 4-5, Section 3, first paragraph, the Amendment dated August 8, 2007, Page 9, last paragraph), the Examiner failed to

provide any reasoning or explanation other than conclusory statements that overlapping ranges would have been obvious to one of ordinary skill in the art (*see* Office Action dated August 5, 2004, Page 3, second paragraph; Office Action dated November 29, 2005, Page 10, third paragraph), and that control of particle size would have been obvious to one of ordinary skill in the art absent a showing of criticality or unexpected results (*see* Office Action dated August 5, 2004, Page 2, fourth paragraph; Office Action dated February 8, 2007, Page 9, second paragraph; Office Action dated September 26, 2007, Page 3, last paragraph). Reliance on such conclusory statements alone to support a § 103(a) rejection is expressly prohibited under *KSR*, and the Examiner erred in concluding that the claimed invention was *prima facie* obvious without providing any “rational underpinning” to support this legal conclusion. *See KSR*, 550 U.S. at 418, 82 USPQ2d at 1396; *In re Kahn*, 441 F.3d at 988, 78 USPQ2d at 1336.

In addition, as previously argued to the Examiner (*see* Pre-Appeal Brief Request for Review dated March 26, 2008, Pages 4-5, Section 3, first paragraph), without first making a *prima facie* case of obviousness, it was improper for the Examiner to assert that Appellants must show criticality or unexpected results to overcome the conclusion of obviousness. Inasmuch as the Examiner never met the initial burden of providing a clear articulation of the reasons for the finding of

obviousness, the burden has not shifted to Appellants to rebut the finding of obviousness with a showing of unexpected results. *See* M.P.E.P. § 2142. Furthermore, even if the Examiner had provided reasons as to why “overlapping ranges or amounts” and “control of particle size” were obvious to one of ordinary skill in the art, which he failed to do, the Examiner failed to consider all of the claim elements present in the independent claims and present reasons as to why each of those claim limitations are obvious. In particular, the Examiner does not explain why it would have been obvious to one of ordinary skill in the art to size two distinct portions of bottom ash such that the first portion comprises a particle size of less than about .006 inches and the second portion comprises a particle size between .75 inches to .003 inches, mix the portions together such that approximately fifty percent of the resulting mixed bottom ash has a particle size less than about .012 inches, or combine the mixed bottom ash with cement in a ratio between 2:1 and 2:3 by weight. The foregoing argument has been previously presented to the Examiner (*see* Pre-Appeal Brief Request for Review dated March 26, 2008, Pages 4-5, Section 3, first paragraph, the Amendment dated August 8, 2007, Page 9, last paragraph). Inasmuch as the Examiner failed to support his conclusion of obviousness in the Office Actions with evidence or explanation, a *prima facie* case of obviousness has not been established.

Finally, if the Examiner intended to rely upon overlapping ranges to establish a *prima facie* case of obviousness, Appellants submit that such reliance is improper. As previously pointed out to the Examiner (*see* Pre-Appeal Brief Request for Review dated March 26, 2008, Page 4, Section 2, first full paragraph; the Amendment dated August 8, 2007, Page 9, third full paragraph; and the Amendment dated January 12, 2007, paragraph bridging Pages 14 and 15), the Examiner has not cited in any of the Office Actions a specific range of particle sizes taught by Nisnevich pertaining to the first and second portions of the bottom ash and/or the resulting particle distribution of the bottom ash as a whole. As discussed above, Nisnevich teaches using as an aggregate bottom ash that is: (1) greater than 4.75 mm in size, (2) less than 4.75 mm in size, or (3) a combination of bottom ash greater than 4.75 mm in size and bottom ash less than 4.75 mm. (*See* Nisnevich, Col. 4, Lines. 22-26 and Lines. 32-39). Thus, Nisnevich teaches that bottom ash of any particle size may be utilized and does not disclose a specific range of particle sizes relating to the bottom ash.

The following argument has never been presented to the Examiner. Inasmuch as Nisnevich does not disclose a particular size distribution for bottom ash, Appellants submit that the Federal Circuit's rule pertaining to overlapping ranges does not apply in this case, or, alternatively, that the supposed particle size

range disclosed in Nisnevich (namely, infinitely small to infinitely large) is too broad to support a *prima facie* case of obviousness. See *In re Peterson*, 315 F.3d at 1392; 65 USPQ2d at 1382 (n. 1). In addition, application of the Federal Circuit's rule here is also inappropriate because the differing ranges of bottom ash particle size are not the exclusive differences between Nisnevich and the claimed invention. See *In re Peterson*, 315 F.3d at 1392; 65 USPQ2d at 1382. In this regard, Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 recite the additional claim limitations (not disclosed in Nisnevich) of sizing two distinct portions of bottom ash, mixing together of the portions such that approximately fifty percent of the resulting mixed bottom ash has a particle size less than about .012 inches, and combining the mixed bottom ash with cement in a ratio between 2:1 and 2:3 by weight. Because there are additional claim elements of the present invention that are not disclosed in the prior art, the existence of overlapping ranges relating to one element is insufficient to establish a *prima facie* case of obviousness. See *In re Woodruff*, 919 F.2d at 1578, 16 USPQ2d at 1936.



- c. Even Assuming the Examiner Made or Could Make a *Prima Facie* Case of Obviousness, Appellants Have Rebutted the *Prima Facie* Case
  - i. The Examiner Erred in Not Considering Appellants' Evidence of Secondary Considerations

The Examiner improperly refused to consider evidence of unexpected results located in the specification of the application. This has been previously pointed out to the Examiner. (See Pre-Appeal Brief Request for Review dated March 26, 2008, Page 5, first full paragraph). The Examiner asserted that it would be difficult to show unexpected results when “the claims directed to the property needed to show unexpected results (ie compressive strength) have all been canceled by Applicants.” (See Office Action dated September 26, 2007, Page 3, last paragraph). Indeed, the Examiner maintained that Appellants could not rely on the high compressive strengths disclosed in the specification as evidence of unexpected results (and therefore nonobviousness), and instead could only rely on what was included in the claims themselves. (See Office Action dated September 26, 2007, Page 4, first full paragraph, which states, “It is improper to argue features not present in their own claims and Applicants cannot rely on their disclosure for the deficiency of limitations in their claims”).

As discussed above, it is well-established that evidence of unexpected results may be set forth in the specification of the application. *See In re Soni*, 54 F.3d at 750, 34 USPQ2d at 1687; M.P.E.P. § 2141. Inasmuch as the Examiner refused to consider the evidence of unexpectedly high compressive strengths set forth in the specification of the application, the Examiner improperly failed to evaluate objective evidence of nonobviousness as mandated by the Supreme Court in *Graham*.

ii. Appellants' Evidence of Secondary  
Considerations Rebuts the *Prima  
Facie Case of Obviousness*

Appellants have presented evidence of unexpected results that overcomes the *prima facie* case of obviousness. As previously pointed out to the Examiner (*see* Pre-Appeal Brief Request for Review dated March 26, 2008, Page 5, first full paragraph), the specification of the present application discloses and provides illustrative working examples that structural products formed from cementitious compositions of the present invention have seven-day compressive strengths of at least about 2,500 psi and twenty-eight-day compressive strengths of at least about 4,000 psi. (*See* Application, Page 5, Paragraph 53). In comparison, the cementitious composition disclosed in Nisnevich comprising only cement and bottom ash (and not the additive) resulted in a twenty-eight day compressive

strength of 4.9 MPa (710 psi). (See Nisnevich, Col. 15, Lines. 10-27). Applicants submit that the substantial increase in compressive strength obtained by the present invention is materially due to the additional recited claim elements not taught by Nisnevich. That is, sizing two distinct portions of bottom ash having the particle size ranges set forth in the independent claims, mixing the two portions together to form a combined bottom ash wherein approximately fifty percent of the bottom ash has a particle size less than about .012 inches, and combining the mixed bottom ash with cement in a ratio between 2:1 and 2:3 by weight each contributed to obtaining a higher compressive strength than was obtained by the comparable composition of Nisnevich.

The substantial improvement in compressive strength of the claimed invention as compared to the cementitious composition composed of bottom ash and cement disclosed in Nisnevich is evidence in itself that the claimed invention is nonobvious and tends to rebut a *prima facie* case of obviousness. See M.P.E.P. § 716.02(a). However, in this case, as discussed above, the high compressive strength values obtained by the claimed invention are that much more unexpected by virtue of the fact that Nisnevich actually taught away from using bottom ash without the additive disclosed in Nisnevich in manufacturing lightweight concretes due to the low compressive strength values associated therewith. (See Nisnevich,

Col. 6, Lines. 27-53). This argument has not been previously presented to the Examiner. Appellants submit that the materially improved and unexpected results obtained by the claimed invention despite the contrary teachings of Nisnevich are further evidence that the subject matter of the claims of the present invention is nonobvious and renders the claims patentable over Nisnevich.

**III. Rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 as  
Anticipated by Crocker**

A. Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 Are Not  
Anticipated by Crocker

1. Legal Requirements For The Rejection of Claims 1, 5,  
26, 27, 33, 34, 36, 37, and 39-41 Under 35 U.S.C.  
§102(b) Based on Crocker

The legal requirements for the rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under §102(b) based on Crocker are the same as those discussed above in Section I.B.1 as pertaining to the rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under §102(b) based on Nisnevich.

2. Crocker Does Not Disclose Every Element of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41

In response to the Examiner's reliance on Crocker for the first time in the Office Action dated July 24, 2008, Appellant's response includes a new argument which has not been previously presented to the Examiner. As discussed previously, Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 all recite sizing two distinct portions of bottom ash, the first portion comprising a particle size of less than about .006 inches and the second portion comprising a particle size between .75 inches to .003 inches, combining these two portions such that approximately fifty percent of the resulting bottom ash mixture has a particle size less than about .012 inches, and combining this resulting bottom ash mixture with Portland cement in a ratio of between 2:1 and 2:3 by weight to create a cementitious composition. None of the foregoing claim limitations are disclosed in Crocker nor does the Examiner assert that they are in any Office Action. In this regard, Crocker discloses a cementitious composition including a dry mixture of hydraulic cement component and an aggregate component. (*See Crocker, Col. 2, Lines. 57-67*). Crocker does not teach the use of bottom ash as an aggregate or the sizing of aggregate at all, let alone teach the sizing of two distinct portions of bottom ash having different size ranges, the mixing of the first and second portions together,

the resulting particle distribution of the bottom ash as a whole, or the combination of the bottom ash and the cement in a ratio between 2:1 and 2:3 by weight.

It appears that the Examiner cited Crocker because it teaches packaging a cementitious composition. (See Office Action dated July 24, 2008, page 3, first paragraph). Specifically, the mere fact that Crocker discloses packaging a cementitious composition is not sufficient to support a rejection under § 102. Crocker fails to teach each and every element of the claimed invention, including those claim limitations discussed above, and therefore Appellants submit that the rejection under 35 U.S.C. § 102(b) is improper and should be reversed. This is the first time this argument has been presented to the Examiner, as this

**IV. Rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 as Obvious Over Crocker.**

**A. Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 Are Not Obvious Over Crocker**

**1. Legal Requirements For The Rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 Under 35 U.S.C. §103(a) Based on Crocker**

The legal requirements for the rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under §103(a) based on Crocker are the same as those discussed

above in Section II.B.1 as pertaining to the rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under §103(a) based on Nisnevich.

2. The Examiner Erred in Rejecting Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 Under 35 U.S.C. § 103(a) Based on Crocker

In response to the Examiner's reliance on Crocker for the first time in the Office Action dated July 24, 2008, Appellant's response includes a new argument which has not been previously presented to the Examiner. In rejecting Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 as obvious over Crocker, the Examiner offered no evidentiary support or explanation for the conclusion of obviousness. In fact, the Examiner merely asserted that Crocker teaches packaging or bagging a mixture of aggregate wherein the container and composition together weigh no more than about one hundred pounds per cubic foot. (See Office Action dated July 24, 2008, page 3, first paragraph). Even if this were true, which Appellants do not herein admit, it is insufficient to support a rejection under §103(a) of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41. At best, this appears to once again be an example of the Examiner rejecting all of the claims pending in the application without providing any rational underpinning to support the rejection. Crocker's teaches packaging or bagging for a mixture of aggregate, not the particular claim limitations of the present invention, namely, the sizing of two distinct portions of bottom ash such

that the first portion comprises a particle size of less than about .006 inches and the second portion comprises a particle size between .0015 inches to .003 inches, the mixing of the portions together such that approximately fifty percent of the resulting mixed bottom ash has a particle size less than about .012 inches, and the combination of the mixed bottom ash with cement in a ratio between 2:1 and 2:3 by weight. Moreover, inasmuch as Crocker does not teach the use of bottom ash as an aggregate or the sizing of the particle size of the aggregate or portions of the aggregate, there are no other teachings in Crocker that the Examiner could point to in order to support his conclusion of obviousness.

Therefore, inasmuch as the Examiner did not explain why each claim limitation of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 would have been obvious to one of ordinary skill in the art, Appellants submit that the Examiner has failed to establish a *prima facie* case of obviousness over Crocker. Furthermore, because Crocker does not teach, motivate, or suggest the particular elements of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41, Appellants submit that the claimed invention would not have been obvious to one of ordinary skill in the art. The foregoing argument is presented herein for the first time.



**V. Rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 as Obvious Over Nisnevich in View of Crocker**

A. Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 Are Not Obvious Over Nisnevich in View of Crocker

1. Legal Requirements For The Rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 Under 35 U.S.C. §103(a) Based on Nisnevich in View of Crocker

The legal requirements for the rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under §103(a) based on Nisnevich in view of Crocker include those discussed above in Section II.B.1 as pertaining to the rejection of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 under §103(a) based on Nisnevich. In addition, obviousness can be established by combining the teachings from multiple references in the prior art where there is some teaching, suggestion, or motivation to do so. *See In re Kahn*, 441 F.3d at 986, 78 USPQ2d at 1335; *see also* M.P.E.P. § 2143.01.

2. The Examiner Erred in Rejecting Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 Under 35 U.S.C. § 103(a) Based on Nisnevich in View of Crocker

In response to the Examiner's reliance on Crocker for the first time in the Office Action dated July 24, 2008, Appellant's response includes a new argument which has not been previously presented to the Examiner. Appellants submit that

the Examiner's reliance on the teachings of Crocker to supplement the teachings of Nisnevich is misplaced. It appears that the Examiner considered the only shortcoming of Nisnevich to be the fact that it does not teach packaging a cementitious composition in a container. (*See* Office Action dated July 24, 2008, Page 3, last paragraph). Therefore, the Examiner points to Crocker for the teaching of that element. (*See* Office Action dated July 24, 2008, Page 3, last paragraph). However, as has been explained in detail herein, Nisnevich's deficiencies as a prior art reference for the claimed invention are not limited to its failure to disclose a container.

In fact, as discussed in detail above in Sections I and II, which arguments are incorporated herein by reference, Nisnevich was insufficient to support a rejection under §102(b) or §103(a) alone because it does not disclose, teach, motivate, or suggest sizing two distinct portions of bottom ash, the first portion comprising a particle size of less than about .006 inches and the second portion comprising a particle size between .75 inches to .003 inches, mixing these two portions such that approximately fifty percent of the resulting bottom ash mixture has a particle size less than about .012 inches, or combining the resulting bottom ash mixture with Portland cement in a ratio of between 2:1 and 2:3 by weight, and because application of the foregoing claim elements produced results that were unexpected

in light of the teachings of Nisnevich. The teachings of Crocker do not cure the foregoing deficiencies. Like Nisnevich, Crocker does not disclose, teach, motivate, or suggest the claim elements of Claims 1, 5, 26, 27, 33, 34, 36, 37, and 39-41 (indeed, Crocker does not teach the use of bottom ash as an aggregate at all). For these reasons, Appellants submit that the Examiner has failed to establish a *prima facie* case of obviousness based upon the combination of the teachings of Crocker with the teachings of Nisnevich and, moreover, the combination of these two references does not in fact render the claimed invention obvious.

**CONCLUSION**

For the foregoing reasons, Appellants respectfully submit that the rejections directed to Claims 1, 5, 26, 27, 33, 34, 36, 37 and 39-41 were improper. Accordingly, the reversal of the rejections directed to Claims 1, 5, 26, 27, 33, 34, 36, 37 and 39-41 is respectfully requested.

Respectfully submitted,

Date: June 24, 2009

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## **APPENDIX**

### **I. Claims**

The following is a clean copy of the claims involved in this appeal.

1. (Rejected) A cementitious composition for mixing with water to form a structural product, the composition comprising:

bottom ash, said bottom ash comprising a first portion and a second portion, said second portion comprising a particle size between .75 inches to .003 inches and said first portion comprising a particle size of less than about .006 inches, said first and second portions being mixed together to provide a particle distribution for said bottom ash wherein approximately fifty percent of said bottom ash has a particle size less than about .012 inches;

Portland cement; and

wherein said bottom ash and said cement are in a ratio between 2:1 and 2:3 by weight.

5. (Rejected) A composition according to Claim 1 wherein the composition has a per unit volume weight of less than about 100 pounds per cubic foot of volume.

26. (Rejected) A cementitious product for mixing with water to form a structural product, comprising:

a container having a volume;

a cementitious composition substantially filling the volume of said container, said composition comprising:

bottom ash, said bottom ash comprising a first portion and a second portion, said second portion comprising a particle size between .75 inches to .003 inches and said first portion comprising a particle size of less than about .006 inches, said first and second portions being mixed together to provide a particle distribution for said bottom ash wherein approximately fifty percent of said bottom ash has a particle size less than about .012 inches;

Portland cement; and

wherein said composition has bottom ash and cement in a ratio between 2:1 and 2:3 by weight, and wherein said container and said composition together weigh less than approximately 100 pounds per cubic foot of volume.

27. (Rejected) A product according to Claim 26 wherein said container and said composition weigh less than approximately 90 pounds per cubic foot of volume.

33. (Rejected) A product according to Claim 26 wherein said container is selected from the group consisting of a paper bag, a plastic bag, and a plastic bucket having a lid.

34. (Rejected) A method of manufacturing a cementitious product for use in forming a structural product, comprising:

providing bottom ash, wherein the bottom ash comprises a first portion and a second portion, the second portion comprising a particle size between .75 inches to .003 inches and the first portion comprising a particle size of less than about .006 inches, said providing step comprising mixing the first and second portions together to provide a particle distribution for the bottom ash wherein approximately fifty percent of the bottom ash has a particle size less than about .012 inches;

mixing the bottom ash with Portland cement in a ratio of bottom ash to cement between 2:1 and 2:3 by weight to thereby provide a cementitious composition; and

packaging the composition in a container wherein the container and the composition together weigh less than approximately 100 pounds per cubic foot of volume.

36. (Rejected) A method according to Claim 34 wherein said providing step comprises removing particles from the bottom ash having a particle size exceeding about .75 inches.

37. (Rejected) A method according to Claim 34 wherein the first portion and second portion are substantially equally weighted.

39. (Rejected) A method according to Claim 34 wherein said packaging step comprises packaging the composition in a container wherein the container and the composition together weigh less than approximately 90 pounds per cubic foot of volume.



40. (Rejected) A method according to Claim 34, wherein said packaging step comprises packaging the composition in a container wherein the container is selected from the group consisting of a paper bag, a plastic bag, and a plastic bucket having a lid.

41. (Rejected) A method of making a structural product, comprising:  
providing bottom ash, wherein the bottom ash comprises a first portion and a second portion, the second portion comprising a particle size between .75 inches to .003 inches and the first portion comprising a particle size of less than about .006 inches, said providing step comprising mixing the first and second portions together to provide a particle distribution for the bottom ash wherein approximately fifty percent of the bottom ash has a particle size less than about .012 inches; and

mixing the bottom ash with Portland cement in a ratio of bottom ash to cement between 2:1 and 2:3 by weight;

mixing an effective amount of water with the cementitious composition; and  
subsequent to said third mixing step, curing the cementitious composition to thereby form a structural product.

## **II. Claims Support and Drawing Analysis**

Annotated claims are provided below, with reference to the Application in braces following each claim limitation.

1. A cementitious composition for mixing with water to form a structural product, the composition comprising:

bottom ash, said bottom ash comprising a first portion and a second portion {Page 4, Paragraphs 47 and 48; Figure 4, Block 46}, said second portion comprising a particle size between .75 inches to .003 inches {Page 5, Paragraph 51; Figure 4, Block 46} and said first portion comprising a particle size of less than about .006 inches {Page 4, Paragraph 48; Figure 4, Block 46}, said first and second portions being mixed together to provide a particle distribution for said bottom ash wherein approximately fifty percent of said bottom ash has a particle size less than about .012 inches {Page 4, Paragraph 45};

Portland cement {Page 4, Paragraph 42}; and

wherein said bottom ash and said cement are in a ratio between 2:1 and 2:3 by weight {Page 4, Paragraph 49; Figure 4, Block 48}.

26. A cementitious product for mixing with water to form a structural product, comprising:

a container having a volume {Page 5, Paragraph 52};

a cementitious composition substantially filling the volume of said container {Page 5, Paragraph 52}, said composition comprising:

bottom ash, said bottom ash comprising a first portion and a second portion {Page 4, Paragraphs 47 and 48; Figure 4, Block 46}, said second portion comprising a particle size between .75 inches to .003 inches {Page 5, Paragraph 51; Figure 4, Block 46} and said first portion comprising a particle size of less than about .006 inches {Page 4, Paragraph 48; Figure 4, Block 46}, said first and second portions being mixed together to provide a particle distribution for said bottom ash wherein approximately fifty percent of said bottom ash has a particle size less than about .012 inches {Page 4, Paragraph 45};

Portland cement {Page 4, Paragraph 42}; and

wherein said composition has bottom ash and cement in a ratio between 2:1 and 2:3 by weight {Page 4, Paragraph 49; Figure 4, Block 48}, and wherein said container and said composition together weigh less than approximately 100 pounds per cubic foot of volume {Page 5, Paragraph 52; Figure 4, Block 50}.

34. A method of manufacturing a cementitious product for use in forming a structural product, comprising:

providing bottom ash, wherein the bottom ash comprises a first portion and a second portion {Page 4, Paragraphs 47 and 48; Figure 4, Block 46}, the second portion comprising a particle size between .75 inches to .003 inches {Page 5, Paragraph 51; Figure 4, Block 46} and the first portion comprising a particle size of less than about .006 inches {Page 4, Paragraph 48; Figure 4, Block 46}, said providing step comprising mixing the first and second portions together to provide a particle distribution for the bottom ash wherein approximately fifty percent of the bottom ash has a particle size less than about .012 inches {Page 4, Paragraph 45};

mixing the bottom ash with Portland cement {Page 4, Paragraphs 42 and 49} in a ratio of bottom ash to cement between 2:1 and 2:3 by weight to thereby provide a cementitious composition {Page 4, Paragraph 49; Figure 4, Block 48}; and

packaging the composition in a container wherein the container and the composition together weigh less than approximately 100 pounds per cubic foot of volume {Page 5, Paragraph 52; Figure 4, Block 50}.

41. A method of making a structural product, comprising:

providing bottom ash, wherein the bottom ash comprises a first portion and a second portion {Page 4, Paragraphs 47 and 48; Figure 4, Block 46}, the second

portion comprising a particle size between .75 inches to .003 inches {Page 5, Paragraph 51; Figure 4, Block 46} and the first portion comprising a particle size of less than about .006 inches {Page 4, Paragraph 48; Figure 4, Block 46}, said providing step comprising mixing the first and second portions together to provide a particle distribution for the bottom ash wherein approximately fifty percent of the bottom ash has a particle size less than about .012 inches {Page 4, Paragraph 45}; and

mixing the bottom ash with Portland cement {Page 4, Paragraphs 42 and 49} in a ratio of bottom ash to cement between 2:1 and 2:3 by weight {Page 4, Paragraph 49; Figure 4, Block 48};

mixing an effective amount of water with the cementitious composition {Page 6, Paragraph 59; Figure 5, Block 62}; and

subsequent to said third mixing step, curing the cementitious composition to thereby form a structural product {Page 6, Paragraph 59; Figure 5, Block 64}.

### **III. Means or Step Plus Function Analysis**

[None]

**IV. Evidence**

[None]

**V. Related Proceedings**

[None]